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COMPOSITION AND METHOD

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1

This invention relates to treatment of concentrated food preparations and the like to inhibit changes therein producing unsightly discoloration and decomposition thereof, and is more specifically concerned with food concentrates and the like containing carbohydrates, particularly the sugars, and amino acids, particularly dicarboxylic amino acids and salts thereof typified by monosodium glutamate.

In the compounding of many concentrated foods, constituents of various kinds are blended together to achieve a finished product having a desired flavor. Some of these constituents may be relatively pure compounds or, at least substances of simple nature as compared with the corresponding components of foods prepared for consumption directly from natural raw food materials. As exemplary of such concentrated food compositions, commonly referred to as "mixes," reference is made to a soup mix consisting of a plastic mass adapted to form the stock of a finished soup, the mix being usually associated in packaging with a suitable proportion of noodles, dehydrated vegetables, or the like. In a typical soup mix this plastic composition was made up of the following ingredients in the proportions specified:

	Per cent
Dextrose	32
Monosodium glutamate.....	15
Vegetable protein hydrolysate.....	2
Fats	20
Salt, spices, and other minor flavoring ingredients.....	31

The above soup mix is selected for the purpose of exemplification of the invention and with a view to instructing others skilled in the art so that they may more readily and fully understand the principles of this invention and the practical application thereof and thus may be enabled to use the invention in numerous different kinds of food and with numerous modifications, each as may be best suited to the requirements of a particular use.

It has been found that the soup mix described above in common with other compositions containing ingredients of the same general nature as the amino acid materials and carbohydrates included in the soup mix, tend to change color and especially to form isolated black spots or "islands" or a general dark brown pigmentation of the entire mass. Comparison was made between a relatively fresh soup mix (about one month old) of the above type and a similar mix about ten months old. The former was a paste,

2

light yellow in color while the latter was brown in color with numerous "islands" of brown-black pigment. It was definitely established that the coloring did not result from bacterial action or any other organic growth, and that the darkened mix was still suitable for use as a food; but the pigmentation, nevertheless, was such as to render the mix less appetizing, and may have reduced vitamin value.

It is accordingly a primary object of the present invention to remove or correct the causes of the said pigmentation and especially to provide means for the inhibition and control of the concomitant chemical reactions.

It is a further object of the invention to improve the keeping qualities of concentrated food mixes containing amino acid material and carbohydrate material without impairment of flavor, vitamin potency or capacity for simple and rapid dehydration.

Although darkening of food products has been observed and known for a very long time, its causes have not been generally recognized. In some cases, it has been shown to be due to enzymic action; in some cases, it has been attributed to oxidation or caramelization occurring during drying operations; in other cases, it has been reported that darkening is due to reactions of substances in the food with metal salts in the water with which the food is mixed or treated; and in still other cases, it appears that darkening is due to a reaction between a sugar and an amino acid. The product of the latter reaction has been produced experimentally, and comparative studies indicate that this experimentally produced pigment corresponds to that normally formed in the soup mix and like dehydrated food products during storage.

In all cases where a pigment was produced in the experimental samples, said samples contained both an amino acid material and a carbohydrate material with at least traces of water and the reaction occurred in the presence of oxygen. These I have determined to be the constituents necessary to the reaction. The designations "amino acid material" and "carbohydrate material" are used advisedly. The former term includes salts and other compositions which may be derived from amino acids wherein the amino acid structure is present. Similarly, "carbohydrate material" is employed to designate compositions having the general basic structure and showing the general properties of sugars or such as to be converted to sugars in some degree during processing or storage. The manner in which